What is claimed is:

1. A direct organic fuel cell comprising:

(a) a fluid fuel comprising formic acid;

(b) an anode to which said fluid fuel is directed, said anode having an electrocatalyst associated therewith, said electrocatalyst comprising palladium nanoparticles;

(c) a fluid oxidant;

(d) a cathode to which said fluid oxidant is directed, said cathode electrically connected to said anode; and

(e) an electrolyte interposed between said anode and said cathode.

2. The direct organic fuel cell of claim 1, wherein said fluid fuel comprises at least 3 M formic acid.

3. The direct organic fuel cell of claim 1, wherein said anode is disposed within an anode enclosure, said fluid fuel flowable within said anode enclosure.

4. The direct organic fuel cell of claim 1, wherein the cathode is disposed within a cathode enclosure, said fluid oxidant flowable within said cathode enclosure.

5. The direct organic fuel cell of claim 1, wherein the electrolyte is an ion exchange membrane.

6. The direct organic fuel cell of claim 5, wherein said electrolyte is a proton exchange membrane.

7. The direct organic fuel cell of claim 6, wherein said proton exchange membrane comprises a perfluorosulfonic acid ionomer.

8. The direct organic fuel cell of claim 5, wherein said ion exchange membrane is substantially impermeable to said fuel stream.

9. The direct organic fuel cell of claim 1, wherein the electrolyte is selected from the group comprising porous silicon, ruthenium oxide, and acid electrolytes.

10. The direct organic fuel cell of claim 1, wherein said anode catalyst comprises palladium nanoparticles, said nanoparticles having at least one of: (a) a diameter of less than about 15 nm, and (b) a radius of curvature less than about 7.5 nm.

11. The direct organic fuel cell of claim 1, wherein said anode catalyst comprises palladium nanoparticles, said nanoparticles having at least one of: (a) a diameter of less than about 10 nm, and (b) a radius of curvature less than about 5 nm.

12. The direct organic fuel cell of claim 1, wherein said anode catalyst comprises palladium nanoparticles, said nanoparticles

having at least one of: (a) a diameter of less than about 6 nm, and (b) a radius of curvature less than about 3 nm.

13. The direct organic fuel cell of claim 1, wherein said anode catalyst comprises palladium nanoparticles with a surface area of at least about 5 m^2/g.

14. The direct organic fuel cell of claim 1, wherein said anode catalyst comprises palladium nanoparticles with a surface area of at least about 23 m^2/g.

15. The direct organic fuel cell of claim 1, wherein said anode catalyst comprises palladium nanoparticles with a surface area of at least about 40 m^2/g.

16. The direct organic fuel cell of claim 1, wherein said fuel comprises between about 21% and about 100% by weight of formic acid.

17. The direct organic fuel cell of claim 1, wherein said fuel comprises between about 25% and about 65% by weight of formic acid.

18. The direct organic fuel cell of claim 1 wherein said fuel comprises at least about 30% by weight of water.

19. The direct organic fuel cell of claim 1 wherein said oxidant comprises air and said formic acid has a concentration between about 50% and about 70% by weight.

20. The direct organic fuel cell of claim 1 wherein said oxidant comprises air and wherein said formic acid has a concentration between about 20% and about 40% by weight.

21. The direct organic fuel cell of claim 1, wherein the cell is capable of generating a power density of at least about 150 mW/cm^2 when operating at about 21°C.

22. The direct organic fuel cell of claim 1 wherein the cell is capable of generating a power density of at least about 270 mW/cm^2 when operating at about 21°C.

23. The direct organic fuel cell of claim 1 wherein the cell is capable of generating an open circuit voltage of at least about 0.8 V.

24. The direct organic fuel cell of claim 1, wherein said anode catalyst is configured to promote reaction of said formic acid via a direct path that diminishes formation of a CO intermediate.

25. An electro-oxidation catalyst for a direct organic acid fuel cell comprising palladium nanoparticles.

26. The electro-oxidation catalyst of claim 25, wherein said catalyst comprises palladium nanoparticles, said nanoparticles having

at least one of: (a) a diameter of less than about 15 nm, and (b) a radius of curvature less than about 7.5 nm.

27. The electro-oxidation catalyst of claim 25, wherein said catalyst comprises palladium nanoparticles, said nanoparticles having at least one of: (a) a diameter of less than about 10 nm, and (b) a radius of curvature less than about 5 nm.

28. The electro-oxidation catalyst of claim 25, wherein said catalyst comprises palladium nanoparticles, said nanoparticles having at least one of: (a) a diameter of less than about 6 nm, and (b) a radius of curvature less than about 3 nm.

29. The electro-oxidation catalyst of claim 25, wherein said catalyst comprises palladium nanoparticles having a surface area of at least about 5 m^2/g.

30. The electro-oxidation catalyst of claim 25, wherein said catalyst comprises palladium nanoparticles having a surface area of at least about 23 m^2/g.

31. The electro-oxidation catalyst of claim 25, wherein said catalyst comprises palladium nanoparticles having a surface area of at least about 40 m^2/g.

32. The electro-oxidation catalyst of claim 25, wherein said catalyst promotes oxidation of formic acid via a direct path that diminishes formation of a CO intermediate.

33. The electro-oxidation catalyst of claim 25, wherein said catalyst is associated with an anode.

34. The electro-oxidation catalyst of claim 33, wherein said catalyst is deposited on the surface of an anode.

35. A direct organic fuel cell comprising:

(a) a fluid fuel comprising formic acid;

(b) an anode to which said fluid fuel is directed, said anode having an electrocatalyst associated therewith, said electrocatalyst consisting essentially of palladium nanoparticles;

(c) a fluid oxidant;

(d) a cathode to which said fluid oxidant is directed, said cathode electrically connected to said anode; and

(e) an electrolyte interposed between said anode and said cathode.

36. The direct organic fuel cell of claim 35, wherein said fluid fuel comprises at least 3 M formic acid.

37. The direct organic fuel cell of claim 35, wherein the electrolyte is an ion exchange membrane.

38. The direct organic fuel cell of claim 37, wherein said electrolyte is a proton exchange membrane.

39. The direct organic fuel cell of claim 38, wherein said proton exchange membrane comprises a perfluorosulfonic acid ionomer.

40. The direct organic fuel cell of claim 37, wherein said ion exchange membrane is substantially impermeable to said fuel stream

41. The direct organic fuel cell of claim 35, wherein the electrolyte is selected from the group comprising porous silicon, ruthenium oxide, and acid electrolytes.

42. The direct organic fuel cell of claim 35, wherein said anode catalyst comprises palladium nanoparticles, said nanoparticles having at least one of: (a) a diameter of less than about 15 nm, and (b) a radius of curvature less than about 7.5 nm.

43. The direct organic fuel cell of claim 35, wherein said anode catalyst comprises palladium nanoparticles, said nanoparticles having at least one of: (a) a diameter of less than about 10 nm, and (b) a radius of curvature less than about 5 nm.

44. The direct organic fuel cell of claim 35, wherein said anode catalyst comprises palladium nanoparticles, said nanoparticles

having at least one of: (a) a diameter of less than about 6 nm, and (b) a radius of curvature less than about 3 nm.

45. The direct organic fuel cell of claim 35, wherein said anode catalyst comprises palladium nanoparticles with a surface area of at least about 5 m^2/g.

46. The direct organic fuel cell of claim 35, wherein said anode catalyst comprises palladium nanoparticles with a surface area of at least about 23 m^2/g.

47. The direct organic fuel cell of claim 35, wherein said anode catalyst comprises palladium nanoparticles with a surface area of about 40 m^2/g.

48. The direct organic fuel cell of claim 35, wherein the cell is capable of generating a power density of at least about 150 mW/cm^2 when operating at about 21°C.

49. The direct organic fuel cell of claim 35, wherein the cell is capable of generating a power density of at least about 270 mW/cm^2 when operating at about 21°C.

50. The direct organic fuel cell of claim 35, wherein the cell is capable of generating an open circuit voltage of at least about 0.8 V.